a1 cncl'd. mounted to a common support with the vibratory element, wherein the vibrating element is a piezoelectric element driving a mechanical resonator and the coil encircles a portion of the piezoelectric element.

[Please delete Claim 2.]

3. (Once Amended) The apparatus of Claim 1, wherein the vibrating element is a piezoelectric element driving a resonator and the coil encircles the mechanical resonator.

a2 7. (Once Amended) A driver apparatus in combination with a vibrating element having a piezoelectric element vibrating a mechanical resonator with a selected contacting portion located to engage and move a driven element in a first direction during use of the vibrating apparatus, the piezoelectric element having an inherent capacitance, the combination comprising:

at least one control element;

a piezoelectric resonator driver circuit having a plurality of unidirectional electrical gates to drive the piezoelectric element, the driver circuit being electrically coupled to and controlled by the control element; the piezoelectric element being electrically coupled to and paired with one of the unidirectional gates; and

at least one electromagnetic storage element electrically coupled to the piezoelectric element, wherein the electromagnetic storage element forms an electric resonator together with the capacitance of the vibrating element; and

wherein the unidirectional electrical gates comprise a diode arranged to prevent a negative electrical voltage to the piezoelectric element, and wherein the driver apparatus resonates at a modulated predetermined first resonant frequency selected to cause the vibrating element to cause the selected contacting portion to move in the first elliptical motion with sufficient amplitude to move the driven element in the first direction when the selected contacting portion engages the driven element, and wherein the driver apparatus resonates at a modulated predetermined second resonant frequency selected to cause the vibrating element to cause the selected contacting portion to move in a second elliptical motion with sufficient amplitude to move a driven element in a second direction when the selected contacting portion engages the driven element.

✓Please delete Claims 9-11.

12. (Once Amended) The combination of Claim 7, wherein the inductor encircles a portion of the resonator.

a3

13. (Once Amended) The apparatus of Claim 7, further comprising a resistor electrically coupled with the inductor and piezoelectric element and gate element to maintain an input voltage to the piezoelectric element within predetermined operating parameters.

[Please delete Claims 14, 15.]

16. (Once Amended) A method for controlling the operation of a vibrating element having a piezoelectric element driving a mechanical resonator, the piezoelectric element being driven by an electrical signal, comprising:

placing a control element in electrical communication with the piezoelectric element and an inductor to alternate the electric signal between the inductor and piezoelectric element, the piezoelectric element providing a capacitance to function as a switched resonance L-C circuit so the electrical signal can resonantly drive the vibrating element at a first frequency;

selecting the first frequency and configuring the vibrating element to cause a selected contacting portion of the vibrating element to move in a first elliptical path with sufficient amplitude to move a driven element in a first direction when the selected contacting portion engages the driven element;

wherein the inductor and piezoelectric element provide a capacitance to function as a switched resonance L-C circuit so that a second electrical signal can drive the vibrating element at a second mechanical resonance frequency, the second frequency selected in conjunction with the configuration of the vibratory element and its mounting to cause the selected contacting portion of the vibrating element to move in a second elliptical path with sufficient amplitude to move the driven element in a second direction when the selected contacting portion engages the driven element.

✓Please delete Claim 20.

a4

21. (New) A driver apparatus in combination with a vibrating element having a piezoelectric element vibrating a mechanical resonator with a selected contacting portion located to engage and move a driven element in a first direction during use of the vibrating apparatus, the piezoelectric element having an inherent capacitance, the combination comprising:

at least one control element;

a piezoelectric resonator driver circuit having a plurality of unidirectional electrical gates to drive the piezoelectric element, the driver circuit being electrically coupled to and controlled by the control element; the piezoelectric element being electrically coupled to and paired with one of the unidirectional gates;

at least one electromagnetic storage element electrically coupled to the piezoelectric element, wherein the electromagnetic storage element forms an electric resonator together with the capacitance of the vibrating element; and

wherein the driver apparatus resonates at a predetermined first resonant frequency selected to cause the vibrating element to cause the selected contacting portion to move in the first motion with sufficient amplitude to move the driven element in the first direction when the selected contacting portion engages the driven element, and wherein the driver apparatus resonates at a predetermined second resonant frequency selected to cause the vibrating element to cause the selected contacting portion to move in a second motion with sufficient amplitude to move a driven element in a second direction when the selected contacting portion engages the driven element.

22. (New ) A piezoelectric driver apparatus for controlling the operation of a vibrating element having a mechanical resonator, apparatus comprising:

a piezoelectric element having an inherent capacitance and driving the mechanical resonator;

at least one switching element allowing the application of a predetermined signal;

at least one electrical resonator driver circuit driving the vibrating element, wherein the driver circuit is electrically coupled to and activated by the switching element;

at least one inductive coil electrically coupled to the vibrating element to form an electric resonator together with the capacitance of the vibrating element so the signal excites the driver circuit at a predetermined frequency, and wherein the same electrical conductor used to form the coil also bridges a space between the vibrating element and the driver circuit.

23 (New) The apparatus of Claim 22, wherein the mechanical resonator has the shape of an elongated member having a longitudinal axis and a second axis perpendicular thereto, the

a4 cont.

resonator having an opening defined by sidewalls and containing the piezoelectric element therein, and wherein every cross-section of the resonator perpendicular to the second axis is the same.

24 (New) The apparatus of Claim 22, wherein the mechanical resonator has the shape of an elongated member having a longitudinal axis and a second axis perpendicular thereto, the resonator having an opening defined by sidewalls and containing the piezoelectric element therein, and wherein every cross-section of the resonator perpendicular to the second axis is the same between, but not including, the piezoelectric element and the selected contacting portion.

25. (New ) A method for controlling the operation of a vibrating element having a piezoelectric element driving a mechanical resonator, the piezoelectric element being driven by an electric signal, comprising:

placing a control element in electrical communication with the piezoelectric element and an inductor to alternate the electric signal between the inductor and piezoelectric element, the piezoelectric element providing a capacitance to function as a switched resonance L-C circuit so the electrical signal can drive the vibrating element at a first frequency;

forming the inductor from an electric conductor that also connects the vibrating element and the circuit; and

selecting the first frequency and configuring the vibrating element to cause a selected contacting portion of the vibrating element to move in a first path with sufficient amplitude to move a driven element in a first direction when the selected contacting portion engages the driven element during use;

wherein the inductor and piezoelectric element provide a capacitance to function as a switched resonance L-C circuit so that a second electrical signal can drive the vibrating element at a second frequency, the second frequency selected in conjunction with the configuration of the vibratory element and its mounting to cause the selected contacting portion of the vibrating element to move in a second path with sufficient amplitude to move the driven element in a second direction when the selected contacting portion engages the driven element during use.

26. (New) The method of Claim 25, wherein the second direction is opposite to the first direction.

a4 cont.

27. (New ) A method for controlling the operation of a vibrating element having a piezoelectric element driving a mechanical resonator, the piezoelectric element being driven by a single electric signal that can be communicated through a first wire to the piezoelectric element, comprising:

placing a control element in electrical communication with the piezoelectric element and an inductor to alternate the electric signal between the inductor and piezoelectric element, the piezoelectric element providing a capacitance to function as a switched resonance L-C circuit so the electrical signal can resonantly drive the vibrating element at a first mechanical resonance frequency; and

selecting the first frequency and configuring the vibrating element to cause a selected contacting portion of the vibrating element to move in a first path with sufficient amplitude to move a driven element in a first direction when the selected contacting portion engages the driven element during use;

wherein the inductor and piezoelectric element provide a capacitance to function as a switched resonance L-C circuit so that a second electrical signal through the first wire can drive the vibrating element at a second mechanical resonance frequency, the second frequency selected in conjunction with the configuration of the vibratory element and its mounting to cause the selected contacting portion of the vibrating element to move in a second path with sufficient amplitude to move the driven element in a second direction when the selected contacting portion engages the driven element during use.

28. (New) The method of Claim 27, wherein the first path is opposite in direction to the second path.

29. (New) The method of Claim 27, further comprising forming the inductor from an electric conductor that also bridges a space between the vibrating element and the control element.

30. (New) The method of Claim 27, further comprising forming the mechanical resonator in the shape of an elongated member having a longitudinal axis and a second axis perpendicular thereto, the resonator being formed with sidewalls defining an opening and containing the

a4 cont.

piezoelectric element therein, with every cross-section of the resonator perpendicular to the second axis being the same.

31. (New) The method of Claim 27, further comprising forming the mechanical resonator in the shape of an elongated member having a longitudinal axis and a second axis perpendicular thereto, the resonator being formed with sidewalls defining an opening and containing the piezoelectric element therein, and wherein every cross-section of the resonator perpendicular to the second axis is the same from and including the sidewalls, to but not including, the selected contacting portion.

32. (New) The method of Claim 31, wherein the first path is opposite in direction to the second path.

33. (New) The method of Claim 27, further comprising forming the piezoelectric element by cofiring.

34. (New) The method of Claim 16, wherein the piezoelectric element comprises a cofired, multilayer piezoelectric element.

35. (New) The apparatus of Claim 21, wherein the piezoelectric element comprises a cofired, multilayer piezoelectric element.

36. (New) A piezoelectric driver apparatus for controlling the operation of a vibrating element having a mechanical resonator, apparatus comprising:

only one piezoelectric element having an inherent capacitance and driving the mechanical resonator;

at least one switching element allowing the application of a predetermined signal;

at least one electrical resonator driver circuit driving the vibrating element, wherein the driver circuit is electrically coupled to and activated by the switching element to drive the vibrating element at a first frequency selected in conjunction with the configuration of the vibratory element and its mounting to cause a selected contacting portion of the vibrating element to move in a first path with sufficient amplitude to move a driven element in a first direction when the selected contacting portion engages the driven element during use, the driver circuit providing a single first signal to the vibrating element; and

a4 cont'd

the driver circuit providing a second signal to the vibrating element to drive the vibrating element at a second frequency selected in conjunction with the configuration of the vibratory element and its mounting to cause the selected contacting portion of the vibrating element to move in a second path with sufficient amplitude to move the driven element in a second direction when the second selected contacting portion engages the driven element during use;

wherein the first and second electrical signals are communicated through the same electrical conductor to the piezoelectric element.

37. (New) The apparatus of Claim 36, wherein the first path is opposite in direction to the second path.

38. (New) The apparatus of Claim 36, further comprising at least one inductive coil electrically coupled to the vibrating element to form an electric resonator together with the capacitance of the piezoelectric, wherein the same electrical conductor used to form the coil also bridges a space between the vibrating element and one of the switching element and the driving circuit.

39. (New) The apparatus of Claim 36, wherein the mechanical resonator is formed in the shape of an elongated member having a longitudinal axis and a second axis perpendicular thereto, and further formed to have an opening defined by sidewalls and containing the piezoelectric element therein, and wherein every cross-section of the resonator perpendicular to the second axis is the same.

40. (New) The apparatus of Claim 36, wherein the mechanical resonator is formed in the shape of an elongated member having a longitudinal axis and a second axis perpendicular thereto, and further formed to have an opening defined by sidewalls and containing the piezoelectric element therein, and wherein every cross-section of the resonator perpendicular to the second axis is the same from and including the sidewalls to but not including the selected contacting portion.

41. (New) The apparatus of Claim 36, wherein the piezoelectric element comprises a cofired, multilayer piezoelectric element.